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Durham, NC 27705

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EXAMINER

ROBINSON, KEITH O NEAL

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/614,255

Applicant(s)

EUBANKS, MARY WILKES

Examiner

KEITH O. ROBINSON

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23 and 44-79 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 23 and 44-79 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action and the following **second non-final** Office Action is set forth. Applicant's cancellation of claims 1-22 and 24-43 and addition of new claims 44-79, filed January 30, 2008, have been received and entered in full. However, Applicant's amendments introduced new matter, as stated below.

Claims 23 and 44-79 are under examination.

Response to Arguments

Applicant's cancellation of claims 24-43 have rendered the claim objections of claims 26-43 on pages 2-3 of the Office Action mailed September 4, 2007 moot.

Applicant's cancellation of claims 24-43 have rendered the 35 USC § 112, first paragraph rejection, with regard to written description, of claims 24-31 and 33-43 on pages 3-5 of the Office Action mailed September 4, 2007 moot.

Applicant's cancellation of claims 24-43 have rendered the 35 USC § 112, first paragraph rejection, with regard to enablement, of claims 24-31 and 33-43 on pages 5-8 of the Office Action mailed September 4, 2007 moot.

Applicant's cancellation of claims 24-43 have rendered the 35 USC § 102 rejection of claims 24-27 on pages 8-9 of the Office Action mailed September 4, 2007 moot.

Applicant's cancellation of claims 24-43 have rendered the 35 USC § 102/103 rejection of claims 28-43 on pages 9-12 of the Office Action mailed September 4, 2007 moot.

The Examiner acknowledges Applicant's statement regarding a typographical error on page 29 of the specification (see page 2, last paragraph of 'Remarks' filed November 15, 2007); however, Applicant is advised to file an amendment to the specification. See MPEP 714 (II) A and 37 CFR 1.121(b).

Claim Objections

Claims 44, 53 and 62 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claims fail to further limit the method of claim 23.

Claims 45, 54, 63 and 72 are objected to because of the following informalities: The claims recite the term "molecular components" It is unclear what constitutes "molecular components" and this term would be anticipated by the prior art. It is suggested that Applicant omits the term "molecular components".

Appropriate correction is required.

Claim Rejections - 35 USC § 112, first paragraph – Written Description

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 44-61 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter

which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Independent claims 44 and 53 are drawn to methods of producing a maize plant wherein said method utilizes the step (step (b)) of backcrossing the trigeneric hybrid at least once to a maize plant. The specification only teaches the trigeneric hybrid backcrossed to a Tripsacum-teosinte hybrid (namely Tripsacorn). See page 22, lines 21-30 of the specification where it discloses lines '3028' and '7022' which are trigeneric hybrids backcrossed to Tripsacorn (i.e. a Tripsacum-teosinte hybrid). There does not appear to adequate written description support for the backcrossing the trigeneric hybrid at least once to a maize plant. Accordingly, the claims are directed to NEW MATTER.

Dependent claims 45-52 and 54-61 are included in the rejection because as there is no literal support for the claimed methods, there is no literal support of any plants produced by the claimed methods.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 23 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,617,492. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method of U.S. Patent No. 6,617,492 and the method of the instant application both use the same restriction fragments to identify plants that have alleles of *Tripsacum/teosinte* hybrids.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

(1) Claims 44-70 rejected under 35 U.S.C. 103(a) as being unpatentable over Eubanks (U.S. Patent No. 5,330,547, July 19, 1994), in view of Eubanks (Theor Appl Genet 94: 707-712, 1997). The claims read on a method for producing a maize plant, wherein said maize plant is produced by cross pollinating a maize plant with either a (*Tripsacum* x *teosinte*) plant or a (*teosinte* x *Tripsacum*) plant to produce a trigeneric

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hybrid maize plant, backcrossing said hybrid plant at least once to a maize plant, and screening said maize plant for the presence of one or more restriction fragments.

Eubanks (1994) teaches crossing a maize plant with a (teosinte x *Tripsacum*) plant (see, for example, column 3, line 64 to column 4, line 2, where it teaches "*Zea diploperennis* [i.e. teosinte] and *Tripsacum dactyloides* have been crossed to produce a novel hybrid referred to as *Tripsacorn*...[a] bridging mechanism to transfer *Tripsacum* genes into maize is provided by *Tripsacorn* which is cross-fertile with maize [and] promises to improve corn by imparting numerous beneficial characteristics including pest resistance and drought tolerance") and backcrossing (see, for example, column 2, lines 30-34, where it teaches "introgression of *Tripsacum* genetic material into maize...has required years of complicated, high risk breeding programs that involve many backcross generations to stabilize desirable *Tripsacum* genes in maize". One of ordinary skill in the art would appreciate that trigeneric hybrid plants can be backcrossed at least once to a maize plant and, in addition, would understand that such a backcross would stabilize desirable *Tripsacum* genes as taught by Eubanks.).

Eubanks (1994) does not teach screening maize plants for the presence of one or more restriction fragments.

Eubanks (1997) teaches screening plants for the presence of one or more restriction fragments (see, for example, page 780, 2nd column, 1st full paragraph where it teaches "[m]apping experiments combining...QTLs and molecular marker loci...have identified over 50 restriction fragment length polymorphisms (RFLPs) that distinguish advanced maize from its putative ancestor, annual teosinte". Also, see, for example,

page 709, Table 1 where it teaches markers used to characterize *Tripsacum* x teosinte hybrids).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of Applicant's invention to combine the above teachings to produce the claimed invention.

One of ordinary skill in the art would have been motivated to combine these teachings because Eubanks (1994) teaches[t]he limited fertility of maize-*Tripsacum* hybrids presents a significant biological barrier to gene flow between these species...and [a]n effective procedure to transfer *Tripsacum* germplasm into maize has been needed by maize breeders and geneticists for many years (see column 2, lines 28-40).

In addition, one of ordinary skill in the art would have reasonable expectation of success based on the success of Eubanks (1994) in crossing *Tripsacum* with maize (see, for example, column 3, line 64 to column 4, line 3, where it teaches "[a] bridging mechanism to transfer *Tripsacum* genes into maize is provided by *Tripsacum* which is cross-fertile with maize").

(2) Claims 44-70 rejected under 35 U.S.C. 103(a) as being unpatentable over Eubanks (U.S. Patent No. PP7,977, September 15, 1992), in view of Eubanks (Theor Appl Genet 94: 707-712, 1997). The claims read on a method for producing a maize plant, wherein said maize plant is produced by cross pollinating a maize plant with either a (*Tripsacum* x teosinte) plant or a (teosinte x *Tripsacum*) plant to produce a trigeneric hybrid maize plant, backcrossing said hybrid plant at least once to a maize

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plant, and screening said maize plant for the presence of one or more restriction fragments.

Eubanks (1992) teaches crossing a maize plant with a (teosinte x *Tripsacum*) plant (see, for example, column 2, lines 14-21, where it teaches “*Tripsacorn* evidently provides a natural bridge for introducing *Tripsacum* germ plasm into corn...[t]he results of crossing *Tripsacorn*...to corn were distinctly different from the results of crossing the patented plant *Sun Dance*...to corn”. One of ordinary skill in the art would understand that this teaches that maize can be crossed with *Tripsacum* x teosinte plants because as discussed above *Tripsacorn* is produce from a cross from *Tripsacum* x teosinte) and backcrossing (see, for example, column 2, lines 9-11, where it teaches “[i]n preliminary field trials of backcrosses to a commercial corn line, drought tolerance and enhanced pest resistance were observed in the F1 generation”. One of ordinary skill in the art would appreciate that trigeneric hybrid plants can be backcrossed at least once to a maize plant.).

Eubanks (1992) does not teach screening maize plants for the presence of one or more restriction fragments.

Eubanks (1997) teaches screening plants for the presence of one or more restriction fragments (see, for example, page 780, 2nd column, 1st full paragraph where it teaches “[m]apping experiments combining...QTLs and molecular marker loci...have identified over 50 restriction fragment length polymorphisms (RFLPs) that distinguish advanced maize from its putative ancestor, annual teosinte”. Also, see, for example,

page 709, Table 1 where it teaches markers used to characterize *Tripsacum x teosinte* hybrids).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of Applicant's invention to combine the above teachings to produce the claimed invention.

One of ordinary skill in the art would have been motivated to combine these teachings because Eubanks (1992) teaches "Tripsacum...provides a natural bridge for introducing *Tripsacum* germ plasm into corn" (see column 2, lines 14-15).

In addition, one of ordinary skill in the art would have reasonable expectation of success based on the success of Eubanks (1992) in crossing *Tripsacum* with corn (see, for example, column 2, lines 18-21 where it teaches "[t]he results of crossing *Tripsacum*...to corn were distinctly different from the results of crossing the patented plant Sun Dance...to corn").

(3) Claims 71-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eubanks (Theor Appl Genet 94: 707-712, 1997), in view of Eubanks (U.S. Patent No. PP7,977, September 15, 1992). The claims read on a method of identifying one or more molecular marker loci associated with a phenotypic trait of interest in maize.

Eubanks (1997) teaches a method of identifying one or more molecular marker loci associated with a phenotypic trait of interest in maize comprising (a) screening a population of plants introgressed by *Tripsacum-teosinte* or *teosinte-Tripsacum* to determine expression of a phenotypic trait of interest (see, for example, page 708, 'Materials and methods' where it teaches an F2 *Tripsacum* derived from selfing F1

Tripsacorn and the use of RFLP probes listed in Table 1. One of ordinary skill in the art would understand that the F2 Tripsacorn is a segregating population and that the RFLP markers listed in Table 1 are used to screen for phenotypic traits of interest); (b) distinguishing plants that exhibit a trait of interest from plants that do not exhibit said trait of interest (see, for example, page 709, 2nd column, 1st paragraph where it teaches unique Tripsacum loci in the Tripsacum-teosinte hybrids that map to maize chromosomes wherein phenotypic traits of interest include such traits as ear morphology and glumes, for example); (c) genotyping each plant with RFLP marker restriction enzyme combinations, (d) determining the presence of one or more restriction fragments in plants and (e) identifying one or more marker-enzyme restriction fragments (see, for example, page 710, Table 2 where it teaches the presence and identification of RFLP marker restriction enzyme combinations such as UMC11, for example).

Eubanks (1997) does not teach plants with disease resistance and drought tolerance.

Eubanks (1992) teaches plants grown from Tripsacorn x corn that are more tolerant to drought and resistant to plant pests (see, for example, column 2, lines 25-31).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of Applicant's invention to combine the above teachings to produce the claimed invention.

One of ordinary skill in the art would have been motivated to combine these teachings because Eubanks (1992) teaches "Tripsacorn...provides a natural bridge for introducing Tripsacum germ plasm into corn" (see column 2, lines 14-15).

In addition, one of ordinary skill in the art would have reasonable expectation of success based on the success of Eubanks (1992) in crossing Tripsacorn with corn (see, for example, column 2, lines 18-21 where it teaches "[t]he results of crossing Tripsacorn...to corn were distinctly different from the results of crossing the patented plant Sun Dance...to corn".

Conclusion

No claims are allowed.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH O. ROBINSON whose telephone number is (571)272-2918. The examiner can normally be reached Monday – Friday, 7:30 a.m. - 4:30 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached at (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Keith O. Robinson, Ph.D.

Examiner

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/David H Kruse/

Primary Examiner, Art Unit 1638

April 25, 2008